



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup>:</b> <b>H04B 1/707, H04L 1/00</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 98/52365</b> <b>(43) International Publication Date:</b> 19 November 1998 (19.11.98)
<b>(21) International Application Number:</b> PCT/US98/09868 <b>(22) International Filing Date:</b> 13 May 1998 (13.05.98) <b>(30) Priority Data:</b> 08/856,428      14 May 1997 (14.05.97)      US <b>(71) Applicant:</b> QUALCOMM INCORPORATED [US/US]; 6455 Lusk Boulevard, San Diego, CA 92121 (US). <b>(72) Inventor:</b> ODENWALDER, Joseph, P.; 14967 Rancho Real, Del Mar, CA 92014 (US). <b>(74) Agents:</b> OGROD, Gregory, D. et al.; Qualcomm Incorporated, 6455 Lusk Boulevard, San Diego, CA 92121 (US).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>  <b>(88) Date of publication of the international search report:</b> 4 February 1999 (04.02.99)
<b>(54) Title:</b> SUBSCRIBER UNIT PLURAL CONTROL AND DATA SOURCES FOR CDMA WIRELESS COMMUNICATION SYSTEM  		
<b>(57) Abstract</b>  A set of individually gain adjusted subscriber channels (402, 404, 411, 415) are formed via the use of a set of orthogonal subchannel codes (Wc, Ws, Wf) having a small number of PN spreading chips per orthogonal waveform period. Data to be transmitted via one of the transmit channels is low code rate error correction encoded and sequence repeated before being modulated with one of the subchannel codes, gain adjusted, and summed with data modulated using the other subchannel codes. The resulting summed data (410, 420) is modulated using a user long code and a pseudorandom spreading code (PN code) and upconverted for transmission. The use of the short orthogonal codes provides interference suppression while still allowing extensive error correction coding and repetition for time diversity to overcome the Raleigh fading commonly experienced in terrestrial wireless systems. The set of sub-channel codes may comprise four Walsh codes, each orthogonal to the remaining codes of the set. The use of four sub-channels is preferred as it allows shorter orthogonal codes to be used, however, the use of a greater number of channels and therefore longer codes is acceptable. Preferably, pilot data is transmitted via a first one of the transmit channels and power control data transmitted via a second transmit channel. The length, or number of chips, in each channel code may be different to further reduce the peak-to-average transmit power for higher rate data transmission.		

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/09868

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H04B1/707 H04L1/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04B H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 95 03652 A (QUALCOMM INC)  2 February 1995  see abstract  see page 8, line 32 - page 9, line 15  see page 9, line 33-39  see page 11, line 14-26  see page 12, line 16-39  see page 16, line 33 - page 17, line 28  ---  -/--</p>	1-15

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Toumpoulidis, T

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**C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 103 459 A (GILHOUSEN KLEIN S ET AL) 7 April 1992 cited in the application see abstract see column 5, line 63 - column 6, line 50 see column 11, line 35-56 see column 18, line 44 - column 19, line 10 see claims 1,2,4,12,21,22 see figures 4A,,4B,,4C ---	1-15
A	US 5 329 547 A (LING FUYUN) 12 July 1994 see abstract see column 7, line 5-49 see claims 1-3,26 see figure 1 ---	1-15
A	US 4 901 307 A (GILHOUSEN KLEIN S ET AL) 13 February 1990 cited in the application see column 5, line 17-60 see column 6, line 54 - column 7, line 4 see column 8, line 16-30 see claims 1,2 see figure 15 ---	1-15
P,X	WO 97 45970 A (QUALCOMM INC) 4 December 1997 see the whole document ---	1-15
P,X	WO 97 47098 A (QUALCOMM INC) 11 December 1997 see the whole document -----	1-15

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